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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/810,561	03/19/2001	Domenico Sanfilippo	204698US0X	6256

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EXAMINER

LANGEL, WAYNE A

ART UNIT	PAPER NUMBER
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1754

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DATE MAILED: 12/19/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

810561

Applicant(s)

Sanfilippo et al

Examiner

Langel

Group Art Unit

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— The MAILING DATE of this communication appears on the cover sheet beneath the correspondence address —

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, such period shall, by default, expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- ☐ Responsive to communication(s) filed on \_\_\_\_\_
- ☐ This action is **FINAL**.
- ☐ Since this application is in condition for allowance except for formal matters, **prosecution as to the merits is closed** in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11; 453 O.G. 213.

## Disposition of Claims

- ☒ Claim(s) 1-25 is/are pending in the application.
- ☐ Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- ☒ Claim(s) 1-25 is/are rejected.
- ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- ☐ Claim(s) \_\_\_\_\_ are subject to restriction or election requirement

## Application Papers

- ☐ The proposed drawing correction, filed on \_\_\_\_\_ is ☐ approved ☐ disapproved.
- ☐ The drawing(s) filed on \_\_\_\_\_ is/are objected to by the Examiner
- ☐ The specification is objected to by the Examiner.
- ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. § 119 (a)-(d)

- ☒ Acknowledgement is made of a claim for foreign priority under 35 U.S.C. § 119 (a)-(d).
- ☒ All ☐ Some\* ☐ None of the:
- ☒ Certified copies of the priority documents have been received.
- ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_
- ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a))

\*Certified copies not received: \_\_\_\_\_

## Attachment(s)

- ☐ Information Disclosure Statement(s), PTO-1449, Paper No(s). \_\_\_\_\_
- ☒ Notice of Reference(s) Cited, PTO-892
- ☐ Notice of Draftsperson's Patent Drawing Review, PTO-948
- ☐ Interview Summary, PTO-413
- ☐ Notice of Informal Patent Application, PTO-152
- ☐ Other \_\_\_\_\_

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The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless --

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Huebler et al. No distinction is seen between the process disclosed by Huebler et al., and that recited in claim 1. Huebler et al. disclose a process for making hydrogen by the steam-iron reaction utilizing countercurrent gas-solids contact, wherein oxidation of  $\text{Fe}_2\text{Fe}_3\text{O}_4$  is conducted in two zones, one principally for the  $\text{Fe}_2\text{FeO}$  reaction and the other principally for the  $\text{FeO}_2\text{Fe}_3\text{O}_4$  reaction; and the reduction of the  $\text{Fe}_3\text{O}_4$  to Fe is

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also conducted in two zones for the same reactions in the reverse direction. (See the Abstract and column 2, line 36 to column 3, line 59.) Huebler et al. specifically disclose at column 3, lines 51 and 52 that the first two reactions occur in the oxidizer and the last four in the reductor.

Claims 2-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Huebler et al. as applied to claim 1 above, and further in view of Cole. Cole discloses a process for oxidizing fuel and transferring the heat produced to a particular use in a combustion system such as fuels conversion. A bed of a mixture of materials forming an unmixed combustion catalyst, which in an oxidized state is readily reducible and in a reduced state is readily oxidizable, is placed in efficient thermal contact with a heat receiver for use in the combustion system. Fuel and air are alternately contacted with the bed, whereby the fuel is oxidized, the air is depleted of oxygen, and heat is liberated. The heat is efficiently transferred to the heat receiver by careful selection of the materials of the bed such that the temperatures produced when the fuel is oxidized and when the air is depleted of oxygen are advantageous to the particular use in the combustion system. (See the Abstract and column 4, line 56 - column 6, line 17.) It would be prima facie obvious from Cole to employ a hydrocarbon as the reducing gas in the process of Huebler et al., since Cole specifically discloses a hydrocarbon

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as a reducing material in Example 1 at column 14, lines 8-31, and Huebler et al. suggest at column 3, lines 10-20 that methane is not detrimental to the system. Regarding claims 8-20, Cole specifically discloses in the paragraph bridging columns 8 and 9 that the unmixed combustion catalyst can be formed from a wide variety of materials, such as tungsten/tungsten oxide, iron/iron oxide and nickel/nickel oxide. Cole also discloses at column 8, lines 43-45 that the noble metals of platinum, palladium and rhodium are some of the most effective catalysts for the chemical reaction of oxidation. It would be further obvious from Cole to employ any of these materials in the reactive phase in the process of Huebler et al.

Claims 1-25 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. It is indefinite as to whether the claims require the production of hydrogen, since the preamble of claim 1 recites "a process for the production of hydrogen", but there are no positive process steps in the main body of the claim which would necessarily require the production of hydrogen. Terms such as "preferably", "as such", "by the use of", "suitable" and "possible" render the scope of the claims vague and indefinite. In claims 8, 13 and 15, the recitation of "selected from . . ." is improper Markush terminology. The

phrase --the group consisting of-- should be inserted after "from" to avoid this rejection. The metes and bounds of claim 20 are vague and indefinite, since claim 20 does not recite the claim from which it depends. Also in claim 20, the recitation of "selected from" is improper Markush terminology, and the word "preferably" renders the scope of the claim further indefinite. In claim 2, it is indefinite as to what relationship "heat supply" has to the rest of the process, especially since the recitation of "heat supply" is not a process step. In claim 5, "preferably" is indefinite. In claim 18, the recitation of "including" renders the scope of the claim vague and indefinite, since it is not clear as to whether the compounds are limited to the recited compounds, or whether the specifically recited compounds are merely examples of suitable compounds. It is also indefinite as to whether the compounds recited in claim 18 must be "pure", since the claim does not specifically require that they be pure, but alludes to their purity by reciting "other pure oxides . . .".

Zeng et al. is made of record for disclosing a moving bed process comprising the high temperature adsorption of oxygen onto an oxygen-selective mixed conductor in an oxygen adsorption zone, and the partial oxidation of hydrocarbons with the adsorbed oxygen in the at least partially oxygen-saturated ceramic adsorbent at elevated temperatures in a reaction zone. Zeng et

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al. specifically disclose in the paragraph bridging columns 3 and 4 that the oxygen adsorption step and the hydrocarbon partial oxidation step may be carried out in separate vessels.

Erickson is made of record for disclosing the hydrogen production from carbonaceous fuels using intermediate oxygen-reduction.

Lyon '362 and Lyon '754 are made of record for disclosing a process wherein a bed of readily reducible metal oxide, the reduced form of this metal oxide being readily oxidized, is placed within a combustion system, and air and fuel are contacted with the bed at an elevated temperature, with the metal oxide oxidizing the fuel and being regenerated by the air.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Wayne A. Langel whose telephone number is (703) 308-0248. The examiner can normally be reached on Monday through Friday from 8 A.M. to 3:30 P.M.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Stanley Silverman, can be reached on (703) 308-3837. The fax phone number for this Group is (703) 305-7718.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-2351.

WAL:cdc

December 16, 2002

**WAYNE A. LANGE**  
**PRIMARY EXAMINER**